the appearance of Halley's comet in the year 1456, by Prof. G. Celoria.

Rivista Scientifico-Industriale, January 15.—Influence of static electricity on lightning conductors, by Prof. Eugenio Canestrini. —On Trouvé's universal incandescent electric lamps (four illustrations), by the Editor.—On the various forms of *Scleranthus marginatus*, Gussone, by Dr. Leopoldo Nicotra.

Zeitschrift für wissenschaftliche Zoologie, December 1884, contains :—Observations on the origin of the sexual cells in Obelia, by Dr. C. Hartlaub (plates 11 and 12).—Studies among the Amœbæ, by Dr. A. Gruber (plates 13 and 14).—On the propagation and development of *Rotifer vulgaris*, by Dr. O. Zacharias (plate 16).—On the amœboid movements of the Spermatozoa of *Polyphemus pediculus*, by Dr. O. Zacharius.—On the uropneustic system in Helicinæ, by Dr. H. v. Ihering (plate 17).—On the metamorphosis in Nephelis, by Dr. R. S. Bergh (plates 18 and 19).—On the intercellular spaces and bridges in epithelia, by P. Mitrophanow.

Morphologisches Jahrbuch, Band x. Heft 3, contains :—On the occurrence of spindle-shaped bodies in the yolk of young frog eggs, by Prof. O. Hertwig (plate 14).—Researches upon the *Pori abdominales*, by H. Ayers (plate 15).—Contribution to a knowledge of the eye in gastropods, by C. Hilger (plates 16 and 17), and a postscript by Dr. O. Bütschli.—Studies on the development of the medullary cord in bony fish, with observations on the first appendages of the germinal vesicle and the chorda dorsalis in Salmonidæ, by N. Goronowitsch (plates 18 to 21).—Dinosaurs and birds : a reply to Prof. W. Dames, by Dr. G. Baur.—On the carpi centrale, and on the morphology of the tarsus in the Mammalia, by Dr. G. Baur.—Remarks on the abdominal pores in fish, by Prof. C. Gegenbaur.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, January 13.—"On the Constant of Electromagnetic Rotation of Light in Bisulphide of Carbon." By Lord Rayleigh, F.R.S.

A complete account is here given of the experiments briefly referred to in the Preliminary Note,[1] and of others on the same plan of more recent date. As regards the method, it may be sufficient to add to what was there said, that the electric currents were estimated by comparing the difference of potential generated by the current in traversing a known resistance with that of a standard Clark cell, the value of the cell being known by converse operations, in which the current was measured by a special electro-magnetic apparatus.[2] Allowance being made for temperature, the determination of the currents by this method was abundantly accurate and very simple.

The results are grouped in three series, of which the first two were considered in the Preliminary Note. In both of them the same tube was used, the principal difference being that in the first the light traversed the tube three times, and in the second but once. In the third series another tube was employed, and some improvements in respect to thermal insulation were introduced. The readings were taken with a double-image prism in place of the ordinary analysing Nicol, a substitution by which it is believed some advantages were obtained.

From the fifteen sets of observations of Series I. we find as the rotation of sodium light in bisulphide of carbon at 18° corresponding to a difference of potential equal to unity C.G.S. the value ·04203 minute. From the four observations of Series II. we get in like manner ·04198 minute, and from the seven observations of Series III. ·04202 minute. The last value is adopted as the most probable.

In an appendix some remarks are made upon polarimetry in general, especially in relation to the half-shade method. A device proposed by M. Becquerel for augmenting the precision with which rotations can be determined with the aid of a half-wave plate is considered, and the conclusion is arrived at that no advantage can thus be obtained.

February 19.—"Note on a Preliminary Comparison between the Dates of Cyclonic Storms in Great Britain and those of Magnetic Disturbances at the Kew Observatory." By Balfour Stewart, F.R.S., and Wm. Lant Carpenter.

The authors had made this comparison, through the kindness of Mr. Whipple, in the case of about thirty storms, the dates of which were taken haphazard from those given by Mr. R. H. Scott in his paper on the cyclonic storms of the last ten years, in the *Quarterly Journal* of the Meteorological Society for October, 1884. Out of these thirty cases, in twenty-three there war a distinct magnetic disturbance, for the most part preceding the storm by somewhat more than a day. The authors intend to pursue the subject, considering that there is a *primâ facie* case for investigation.

Geological Society, February 20.—Annual General Meeting.—Prof. T. G. Bonney, F.R.S., President, in the chair.—The Council's Report announced the awards of the various medals and of the proceeds of the Donation Funds in the gift of the Society.—In handing the Wollaston Gold Medal to Dr. W. T. Blanford, F.R.S., for transmission to Mr. George Busk, F.R.S., F.G.S., the President addressed him as follows :—The Council of the Geological Society has awarded to Mr. George Busk the Wollaston Medal in recognition of the value of his researches in more than one branch of palæontology. Polyzoa, not only fossil, but also recent, he has made peculiarly his own, and his numerous separate papers, his British Museum Catalogue, and his memoir on the Polyzca of the Crag, have entitled him to the lasting gratitude of workers at this class of the Molluscoida. But, perhaps as a relief to the study of these minute invertebrates, he has occupied himself, not less successfully, with the larger vertebrata, so that to him we are indebted for much information on the fauna of Post-tertiary deposits, especially from the caves of Malta and of Brixham. Permit me, in handing you this medal for transmission to Mr. Busk, to express my pleasure at having such a duty to discharge, and my earnest hope, in which I am sure all present will share, that restored health may enable him to continue his work in the cause of our science.—The President then presented the balance of the proceeds of the Wollaston Donation Fund to Dr. Charles Gallaway, F.G.S., and addressed him as follows :—The Council of the Geological Society has awarded to you the balance of the proceeds of the Wollaston Donation Fund, in recognition of the value of your researches among the older British rocks. By your identification of Upper Cambrian rocks in Shropshire you have placed beyond question the antiquity of the Rhyolitic Group of the Wrekin, our knowledge of which and of yet older rocks in that district you have greatly augmented. Your contributions also to the geology of Anglesey and to unravelling the stratigraphy of the Scotch Highlands have been of great value, and we look forward to the results of further researches, in aid of which I have great pleasure in placing in your hands the amount of the award. That you receive it from a fellow-labourer will, I hope, make it not the less welcome. The President then handed the Murchison Medal to Dr. Henry Woodward, F.R.S., for transmission to Dr. Ferdinand Römer, F.M.G.S., of Breslau, and addressed him as follows :—The Council has awarded to Dr. Ferdinand Römer the Murchison Medal and a sum of ten guineas from the Donation Fund. His life-long and unwearied labours in the service of our science have long since made his name familiar to his fellow-workers. When I state that the Royal Society Catalogue, published now more than eleven years since, records the titles of 122 separate memoirs written by him, when I mention his other important works, such as that on "The Chalk Formation of Texas," on "The Silurian Fauna of Tennessee," on "The Geology of Upper Silesia," and the "Lethæa Geognostica," I have said enough to prove that this memorial of an illustrious geologist could not well have been bestowed on a more illustrious recipient. In transmitting it to Dr. Römer, be so kind as to express our regret that the distance and the season of the year have deprived us of the pleasure of his presence on this occasion. In presenting the balance of the proceeds of the Murchison Geological Fund to Mr. Horace B. Woodward, F.G.S., the President addressed him as follows :—The balance of the proceeds of the Murchison Donation Fund has been awarded to you in recognition of the good service which you have already rendered to geology, especially by your work among the later deposits of the eastern counties, and to aid you in further researches. But the excellent papers which you have written, in addition to the work done by you as a member of the Geological Survey, do not constitute your only claim to our recognition. You have made use of the opportunity of your official position to promote a love of science among those who live in our eastern counties, and we are indebted to you for that admirable volume, "The Geology of England and Wales," which, though in one sense a compilation, is such a one as only

[1] *Proc. Roy. Soc.* vol. xxxvii. p. 146.

[2] "On the Electro-chemical Equivalent of Silver, and on the Absolute electromotive Force of Clark Cells." *Proc. Roy. Soc.*, vol. xxxvii. p. 142.

a skilled geologist could produce. The President next presented the Lyell Medal to Prof. H. G. Seeley, F.R.S., F.G.S., and addressed him as follows:—The Council has awarded to you the Lyell Medal and a grant of 40*l.* in recognition of your investigations into the anatomy and classification of the Fossil Reptilia, especially the Dinosauria. Not that you have limited yourself to this field of research; your papers on *Emys* and *Psephophorus*, on *Megalornis* and British Fossil Cretaceous Birds, on *Zeuglodon*, and on remains of Mammalia from Stonesfield, prove your extensive knowledge of vertebrate palæontology, as your proficiency in invertebrate is evidenced by your earlier work, both stratigraphical and directly palæontological. Furthermore, your excellent edition of the first volume of Phillip's "Manual of Geology" indicates an exceptional familiarity with the literature of our science. Since our acquaintance first began, some twenty years since, at Cambridge, we have both had our disappointments and our successes; you, undiscouraged by the one, unelated by the other, have pushed on to your present high position in science, making no enemies, winning many friends. I trust that your future career may be even more prosperous than your past, and that this medal may be an augury of many good gifts of fortune. You will, I know, believe me when I say that I feel an exceptional pleasure in being commissioned to place in your hands this medal, commemorative of the great geologist whose philosophic spirit you so well appreciate, and whose memory, I know, you so greatly revere. The President then handed the balance of the proceeds of the Lyell Geological Fund to Mr. J. J. H. Teall, F.G.S., for transmission to Mr. A. J. Jukes-Browne, F.G.S., and addressed him as follows:—The balance of the Lyell Donation Fund has been awarded to Mr. A. J. Jukes-Browne in recognition of the excellent work that he has done on the Cretaceous formation and on glacial geology, and to aid him in further researches. His papers on the Cambridge greensand cleared up many difficulties connected with that interesting formation; and in his Sedgwick prize essay on the Post-tertiary deposits of Cambridgeshire he commenced those investigations which have since brought us more than one valuable contribution on glacial and later deposits. You can tell him that his old college tutor feels a little pardonable pride and much real pleasure in being the instrument of placing this award in your hands for transmission to him. In presenting the Bigsby Gold Medal to Prof. Renard, of Brussels, the President addressed him as follows:—When to a familiarity with geology in the field and a love of nature are united the skill of a finished chemist and the experience of a practised worker with the microscope, the results cannot fail to be of the utmost importance to our science. These qualifications, rarely united in any one man, are in yourself combined with an untiring industry and a love of science for its own sake. Thus we are indebted to you for many important contributions to our knowledge in geology. Your early memoir, "Sur les Roches Plutoniennes de la Belgique et de l'Ardenne Française," written in conjunction with M. de la Vallée Poussin, will long be classic; your papers on various subjects connected with the Carboniferous limestone, on the cotícule, the phyllites, and other altered rocks of Belgium, and on the deep-sea deposits, are too well known to need more than mention, and in recognition of these the Council has awarded you the Bigsby Medal. In placing it in your hands may I be allowed to express for myself and others the hope that it will be always a pleasant *souvenir* of your many friends on this side of the Channel, some of whom, myself included, will not soon forget the pleasant and, to us, most profitable days spent under your guidance in geological studies by the limestone cliffs of the winding Meuse and the wooded crags of the Ardennes. The President then read his Anniversary Address, in which, after giving obituary notices of some of the members lost by the Society during the year 1884, he referred to the principal contributions to geological knowledge which have been made during the past year, both in the publications of the Society and elsewhere in Britain, concluding with a notice of the new views which have been adopted with regard to the structure of the Western Highlands, and a brief history of the steps by which they have been arrived at. The concluding portion of the address was devoted to a discussion of the principles of nomenclature which should be followed in petrology, with remarks on the classification of igneous rocks, and on the significance of certain structures, especially the more minute.—Officers and Council, 1885:—President: Prof. T. G. Bonney, F.R.S.; Vice-Presidents: W. Carruthers, F.R.S., John Evans, F.R.S., J. W. Hulke, F.R.S., J. A. Phillips, F.R.S.; Secretaries: W. T. Blanford, F.R.S., Prof. J. W. Judd, F.R.S.; Foreign Secretary: Warington W. Smyth, F.R.S.; Treasurer: Prof. T. Wiltshire, F.L.S.; Council: H. Bauerman, W. T. Blanford, F.R.S., Prof. T. G. Bonney, F.R.S., W. Carruthers, F.R.S., Prof. W. Boyd Dawkins, F.R.S., John Evans, F.R.S., A. Geikie, F.R.S., Henry Hicks, M.D., Rev. Edwin Hill, M.A., G. J. Hinde, Ph.D., John Hopkinson, W. H. Hudleston, F.R.S., J. W. Hulke, F.R.S., Prof. T. Rupert, F.R.S., Prof. J. W. Judd, F.R.S., J. E. Marr, M.A., J. A. Phillips, F.R.S., Prof. J. Prestwich, F.R.S., Warington W. Smyth, F.R.S., J. J. H. Teall, M.A., W. Topley, Prof. T. Wiltshire, F.L.S., Rev. H. H. Winwood, M.A., Henry Woodward, F.R.S.; Assistant-Secretary, Librarian, and Curator: W. S. Dallas, F.L.S.; Clerk: W. W. Leighton; Library and Museum Assistant: W. Rupert Jones.

Physical Society, February 28.—Prof. Guthrie, President, in the chair.—Messrs. G. R. Begley and O. Chadwick were elected Members of the Society.—Mr. J. C. McConnel presented two notes on the use of Nicol's prism. The first note related to the error in measuring a rotation of the plane of polarisation due to the axis of rotation of the prism not being parallel to the emergent light. After pointing out that this error was, to a first approximation, eliminated by taking the mean of the readings in the two opposite positions of the Nicol, the author proceed to push the calculation to a second approximation, so as to get a measure of the residual error. This is given by the equation—

$$\frac{\theta+\theta_1}{2} - \psi = \text{const.} + .24r^2 \sin\psi\cos\psi,$$

where θ and $180 + \theta_1$ are the two readings of the circle; ψ the angle between the plane of polarisation and a fixed plane, and r the angle between the axis of rotation and the incident light. This equation is practically correct for a flat-ended as well as an ordinary Nicol. The residual error cannot amount to 1′ in a rotation of 60° if r is less than 2°. The optical properties of the Nicol tend to neutralise the geometrical error due to the rotation taking place about one axis and being measured about another. The second note dealt with a new method of obtaining the zero reading of a Nicol circle. This is often defined as the reading when the plane of polarisation is parallel to the axis of rotation of the table of a spectrometer. A Nicol is fixed on the table, the light quenched by turning the Nicol circle, and the reading taken. The table is then rotated through 180°, the light quenched, and the reading taken again. The mean of the two readings gives the result required. It was described how the error due to the want of symmetry of the Nicol might be found and eliminated.—Mr. H. G. Madan exhibited and described some new forms of polarising prisms. The first of these is by M. Bertrand, and has been described by him (*Comptes Rendus*, September 29, 1884). The prism consists of a parallelopiped of dense flint glass of refractive index 1·658, the same as that of Iceland spar for the ordinary ray. The glass prism is cut like the spar of a Nicol's prism, a cleavage plate of spar being cemented between the two halves by an organic cement of refractive power slightly greater than 1·658. A beam of light traversing the prism is incident upon the spar at an angle of 76° 44′. The ordinary ray passes through without change, but the extraordinary ray is totally reflected at the first surface. The prism gives a field of 40°. M. Bertrand's prism has the great advantage of requiring only a very small quantity of Iceland spar, a substance that is becoming very scarce and expensive. The other prisms shown were: a similar one by M. Bertrand, described in the same paper; a double-image prism by Ahrens, described in the *Phil. Mag.* for January, 1885; and a modification of the latter by Mr. Madan, described in NATURE for February 19. Mr. Lewis Wright pointed out as a practical objection to M. Bertrand's prism that it was very doubtful whether a glass could be obtained of so high a density as to possess a refractive index of 1·658 and at the same time be colourless and unaffected by the atmosphere. He also remarked that the principle of the prism was by no means new.—Prof. W. E. Ayrton read a paper by himself and Prof. J. Perry on "The most economical potential difference to employ with incandescent lamps." The authors commenced by pointing out the importance of experiments being made on the lives of incandescent lamps, in addition to experiments on efficiencies. Referring to the experiments on life given by M. Foussat in *The Electrician* for January 31, they showed that if p be the price of a lamp in pounds, n the number of hours per year that it burns, $f(v)$ the

life of the lamp in hours, and $\theta(v)$ the number of candles equivalent to the lamp, $f(v)$ and $\theta(v)$ being expressed as a function of the potential difference in volts $\frac{p \times n}{f(v) \times \theta(v)}$ stands for the cost per year per candle, as far as the renewal of lamps is concerned. Also, if H stands for the cost of an electric horse-power per year for the number of hours electric force is employed, and $p(v)$ the number of watts per candle, $\frac{H}{746} \times p(v)$ stands for the cost per year per candle as far as the production of power is concerned. The sum of these two represents the total cost per candle per year, and the value of v that makes this a minimum may be found either graphically or analytically. Solving the problem graphically for the 108 volt Edison lamps used at the Finsbury Technical College, where n may be taken as 560 and $H = 5l.$, they find that the minimum value of the total cost is given by $v = 106$. The curve connecting total yearly cost per candle with v they found to be very flat at this point, showing that the lamps may be burnt with a potential difference varying as much as 4 volts, with only 5 per cent. addition to the annual cost. It is found that with certain types of incandescent lamps the candle-power of the lamp varies as the potential difference minus a constant. The authors also find that in rough photometric experiments No. 8 sperm candles may be substituted for standard ones.—Mr. Macfarlane Gray gave an account of a most extended investigation upon the second law of thermodynamics. From considerations connected with the specific heats of liquids and gases the author comes to the conclusion that the second law is not true. The experimental results used are chiefly those of Regnault, to which, however, Mr. Gray has applied some corrections.

EDINBURGH

Royal Physical Society, February 18.—The Rev. Prof. J. Duns, D.D., F.R.S.E., President, in the chair.—The following communications were read, viz. :—Prof. W. Turner, F.R.S., exhibited and described a collection of fossil bones of mammals obtained in excavating the new dock and a gas-holding tank at Silloth. He was indebted for these to Dr. Leitch, Mr. Charles Boyd, and Mr. J. T. Middleton. The specimens consisted of antlers and a humerus of the Red Deer, vertebræ of two whales and two skulls and some of the bones of the limbs of the great extinct ox of Britain, *Bos primigenius*. Those found in excavating the dock were within a short distance of each other, lying in a bed of wet gravel and shingle, mixed with oyster, mussel, and cockle beds, the material overlying the bones being twenty-six feet in thickness. One of the antlers contained eight points, and it is doubtful if a finer specimen could be found on any existing red deer. The lower jaw of one skull of the *Bos primigenius* was obtained, and it is apparently the only specimen that had been seen in Britain, and, comparing it with the wild cattle in Cadzow Forest, he found that the extreme length of the jaw of the fossil ox was 18¼ inches, as against 15⅝ inches in the Hamilton cattle, being a difference of nearly 3 inches. The leg bones also showed the massive character of the Great Ox, and enabled the Society to realise its magnitude.—Dr. R. Milne Murray, M.A., M.R.C.P.E., described and exhibited some new modifications of recording apparatus.—Dr. Ramsay Traquair, F.R.S., described and exhibited a new fossil fish, *Elonichthys multistriatus*, found in the black-band ironstone at Gilmerton.—Mr. George Brook, F.L.S., described a new method for the aëration of marine aquaria.—Mr. John Hunter, F.C.S., read a paper on a new modification of Lunge's nitrometer.—Prof. A. G. Nathorst and Prof. Gustav Lindström, of Stockholm, have been elected Corresponding Fellows of the Society.

Institution of Civil Engineers, February 19.—Sir Frederick J. Bramwell, F.R.S., President, in the chair.—The second of a course of lectures on "The Theory and Practice of Hydromechanics" was delivered by Dr. William Pole, F.R.SS., L. and E., M.Inst.C.E., Honorary Secretary of the Institution, the subject being "Water Supply."

CAMBRIDGE

Philosophical Society, February 16.—Prof. Foster, President, in the chair.—The following communications were made to the Society :—Some remarks on the urea-ferment, by Mr. A. S. Lea.—On the occurrence of reproductive organs on the root of *Laminaria bulbosa*, by Mr. Walter Gardiner.—On the types of excretory system found in the Enteropneusta, by Mr. W. Bateson.

SYDNEY

Linnean Society of New South Wales, December 31, 1884.—C. S. Wilkinson, F.L.S., President, in the chair.—The following gentlemen were present as visitors :—Messrs. W. H. Caldwell, B.A., C. E. Smith, James Mosely, Alex. Hamilton.—The following papers were read :—Occasional notes on plants indigenous in the immediate neighbourhood of Sydney, No. 8, by Edwin Haviland.—The geology and physical geography of the State of Perak, by the Rev. J. E. Tenison-Woods, F.G.S., &c.—Note on an apparently new parasite affecting sheep, by R. von Lendenfeld. In several localities sheep were affected by a disease similar in appearance to epithelial cancer, which appeared on the feet behind the hoofs and on the lips. The histological investigation shows that the rete malphigii is inflamed and the Papillæ attain a very large and abnormal size ; the outer layer of the skin and the horny epithelium are very much thickened, and it is apparent that between the horny layer granular masses, apparently parasites, are disposed, in which nuclei can be detected. The author supposes these to be an Amœba, and to cause by irritation the hypertrophy of the epithelium. The sections were exhibited under the microscope ; the specimens were hardened with chromic acid and stained with picric acid carmin.—On the temperature of the body of *Ornithorhynchus paradoxus*, by N. de Miklouho-Maclay. The result of some observations on the temperature of the *Ornithorhynchus* is here given, showing it not to exceed 40° C. or 76° Fahr. Previous observations made by the Baron had shown that the temperature of the body of the Echidna was at least 5° Fahr. higher than that of the other Monotreme.—Mr. W. H. Caldwell, B.A., exhibited several specimens which he had recently obtained in Queensland, showing the stages in the development of the Monotremes from the laying of the egg to the hatching.—Mr. J. Mitchell, of Bowning, exhibited a large number of Silurian fossils collected by him in the neighbourhood of Bowning. They consisted of a variety of mollusks, corals, and about sixteen species of trilobites. Among the trilobites are *Phacops caudatus*, *P. longicaudatus*, *P. encrinurus punctatus*, and *P. Jamesii* (?), *Calymene* (*Lenaria* ?), *Harpes ungula*, *Staurocephalus Murchisonii*, *Bronteus*, and several of the genus *Acidapsis*, one of which attained a considerable size. The mollusks included representatives of *Pentamerus*, *Orthoceras*, *Avicula*, *Strophomena*, &c.

PARIS

Academy of Sciences, March 2.—M. Bouley, President, in the chair.—Note on "Les Origines de l'Alchimie," by the author, M. Berthelot. In this work the origin of alchemy, forerunner of the modern science of chemistry, is traced back by means of Greek manuscripts and Egyptian papyruses to the remotest historic times.—Researches on isomery in the aromatic series ; heat of neutralisation of the polyatomic phenols, by MM. Berthelot and Werner.—Observations of the small planets and of Wolff's comet made with the great meridian at the Paris Observatory during the last quarter of the year 1884, communicated by M. Mouchez.—On the periodicity of the solar spots, and the anomaly of their last maximum, by M. Faye. The periodicity is regarded as established, and the irregularity in the last maximum is referred to a possible quasi independence of the northern and southern solar hemispheres, in virtue of which the epochs of their respective greatest activity may not coincide exactly.—First explorations of the mission sent by the Academy to study the recent earthquakes in the south of Spain, by M. Fouqué. The mission, consisting of MM. Fouqué, Lévy, Bertrand, Barrois, Offret, Kilian, and Bergeron, arrived at Malaga on February 7, and from that point visited Periana, Zaffararia, Venta de Zaffararia, Alhama, Arenas del Rey, and Albuñuclas, which places suffered most during the disturbances.—On a characteristic reaction of the secondary alcohols, by M. G. Chancel.—Action of oxygenated water on the oxides of cerium and thorium, by M. Lecoq de Boisbaudran.—Correction of a previous communication (*Comptes Rendus*, February, 1879, p. 322) regarding the spectrum of Samarium, by M. Lecoq de Boisbaudran.—On the prevailing winds of North Persia, and on the south wind of the province of Ghilan, by M. J. D. Tholozan.—Report of the International Commission for the widening and deepening of the Suez Canal, presented by M. de Lesseps.—Election of M. Grand' Eury as Corresponding Member for the Section of Botany in place

of the late M. Duval-Jouve.—Reply to some of the criticisms, formulated in connection with the note of January 5, on the reproduction of phylloxera and the employment of the sulphate of carbon for its destruction, by M. P. Boiteau.—On the spectrum and formation of the tail of Encke's comet, by M. Ch. Trépied.—On a theorem of M. Darboux in mathematical analysis, by M. E. Picard.—The poles of the gyroscope and rotating solids in connection with Coriolis's theorem, by M. Henry.—On the maxim phase in the diurnal variations of terrestrial magnetism in 1882, according to the results obtained at the Montsouris Observatory, by M. L. Descroix.—Claim of priority in respect of the process of annulation of the extra current employed by M. d'Arsonval to avoid the dangers of mechanical generators of electricity, by M. A. Doussin.—On the means of counteracting or diminishing the dangers of the extra current in dynamo-electric machines in case of rupture in the exterior circuit, by M. J. Raynaud.—On the limit of density and atomic value of the gases, and especially of oxygen and hydrogen, by M. E. H. Amagat.—Composition of the gaseous products of the combustion of iron pyrites, and influence of Glover's tower on the production of sulphuric acid, by M. Scheurer-Kestner.—On the separation of alumina and the sesquioxide of iron, by M. P. Vignon.—On some basic and ammoniac nitrates, by M. G. André.—On the composition of the glyoxal-bisulphate of ammonia ($C_4H_2O_4$, $2(AzH_4O, S_2O_4)$, $2HO$), by M. de Forcrand.—Action of the sulphate of cinchonamine on the circulation and secretions, by MM. G. Sée and Bochefontaine.—On the substitution of quinine for creosote and phenic acid in the treatment of typhoid fever, by M. G. Pécholier. Measure of the pressure necessary to determine the rupture of blood-vessels, by MM. Gréhant and Quinquaud.—On some peculiarities relative to the connections of the cervical ganglia of the sympathic nerve and the distribution of their afferent and efferent branches in *Anas boschas*, by M. F. Rochas.—On the nature of the placental neo-formation, and on the unity maintained in the development of the placenta, by M. Laulanie.—Note on the fœtus and placenta of a gibbon, by M. J. Deniker.—On some points in the physiology of the muscular system of the invertebrates, by M. H. de Varigny.—On *Bos triceros*, Rochbr., and on preventive inoculation against epizootic peripneumonia as practised by the Moors and Fulahs of Senegambia, by Dr. A. T. de Rochebrune. This variety of domestic ox, peculiar to Senegambia, is characterised by a third horn growing from the nasal process and identical in its constitution and development to the two frontal horns. The variety, which is of unknown origin, is thoroughly established, and from time immemorial has been inoculated by the natives with the virus of epizootic peripneumonia, a disease prevalent in the country.—On the mosses of the Carboniferous epoch, by MM. B. Renault and R. Zeiller.—Origin of the iron, magnesia, and zinc ores in and at the foot of the Jurassic Limestone hills on the periphery of the central plateau in France, by M. Dieulafait.—On a remarkable deposit of running water in the mines of Carmaux, Tarn, by M. Stan. Meunier.—Destructive effects of a waterspout which recently passed over the Argentan district, Orne, by M. E. Vimont.—A new method of observing stars during their transit across the meridian, by M. Ch. V. Zenger.

BERLIN

Physiological Society, February 13.—Prof. Fritsch produced a few specimens of *Lophius piscatorius*, and drew special attention to the two rays situated above the wide gape, and ending in flap-like appendages, which in some had the shape of a fly, in others that of a worm, and were used by the fish as bait to attract its prey. The jaws and fins were likewise covered with flap-like appendages, excrescences of the skin, which rendered the animal, especially in mud, completely irrecognisable. The peculiar development of the skin of this fish induced the speaker to search for corresponding peculiarities in its nervous system—peculiarities which he soon discovered in its medulla oblongata. He found there, on the posterior side of the medulla, and quite superficially situated, a group of huge ganglion-cells, recognisable by means of a lens, such as had hitherto been found only in Malapterurus. While, however, this latter fish possessed but two such gigantic cells, Lophius had a larger number of them, and these offered for study a series of general problems on the structure of ganglion cells. The protoplasm of these colossal nerve-cells was not fibrous, but granular, the nucleus large and bladder-like. The nutriment was provided by a close capillary net which closed tightly around the protoplasm and sent loops into its recesses. The cells were multipolar, yet one process, which in every case was the peripherical, preponderated in size over all the others. From these cells there branched off gigantic nervous fibres consisting of powerful fibrous axis cylinders and sheaths. Such gigantic nerves were found partly also in the roots of the vagus and trigeminus, and probably spread to the peculiar cuticular appendages of Lophius. Altogether Prof. Fritsch believed he was justified in concluding from what he had observed in his investigations of the ganglion-cells of Lophius, that there were neither apolar nor unipolar ganglion-cells, but only bipolar and multipolar, and that the processes of the ganglion-cells might unite, so that frequently an axis-cylinder would be produced from two ganglia.—Dr. Uhthoff spoke in detail of the experiments carried out by him in the Physical Institute regarding the dependence of visual acuteness on light intensity. By way of supplement to the report on the subject given by Dr. König at a recent meeting of the Physical Society, be it here observed that differences among the eyes examined showed themselves specially under weak light intensities, and that the minimum of visual acuteness (1-1000th of the normal value) was, in particular cases, still observable under an illumination corresponding with the removal of the petroleum lamp to a distance of 360 m. The visual acuteness was further examined under a changing intensity with red and blue light. Red light, just as much as white, showed with increasing intensity a very rapid increase of visual force. The curve in the case of red light was, however, different from that in the case of white light. Under a blue light the visual sharpness very slowly declined with increasing light intensity. Dr. Uhthoff next described an apparatus he had constructed for the purpose of measuring the angle of the visual line with the line perpendicular to the cornea, without the use of the ophthalmometer. The principle of the apparatus was based on measuring the angular displacement of a plane paralleled glass plate, the glass plate standing perpendicular first to the normal and then to the (actual) visual line. Both the apparatus of Dr. Uhthoff and the microscopical preparations of the gigantic ganglion-cells and fibres of Lophius were shown to the Society in the demonstrating hall.

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